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A STUDY OF PEDIATRIC EMERGENCY ROOM UTILIZATION AND IMPLICATIONS AT REYNOLDS ARMY COMMUNITY HOSPITAL FORT SILL, OKLAHOMA

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of
Master of Health Care Administration

by

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This study examined the usage of the pediatric emergency room to determine the optimum method of providing emergency services. Seven reasons were identified for children using the emergency room services when they do, primarily based on parent availability. This study recommended chages to the pediatric services to improve the overall service to the customer. Particular emphasis was made on educating the parents on the alternative service of same day appointments to reduce emergency room usage for nonemergencies.

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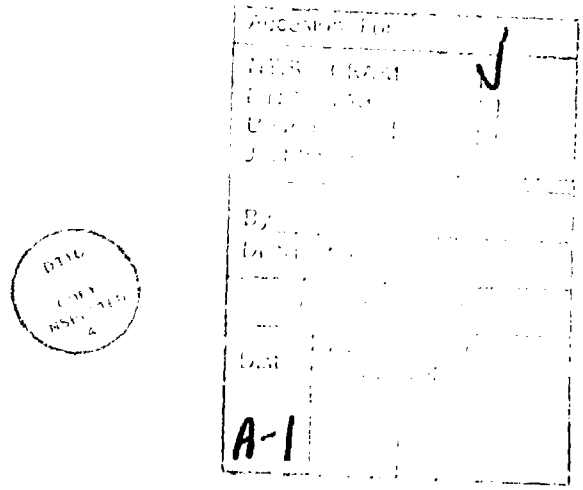


TABLE OF CONTENTS

LIST OF TABLES iv

LIST OF FIGURES v

Chapter

I. INTRODUCTION 1

Problem Development 1
Literature Review 4
Footnotes 6

II. DISCUSSION 8

The Macrosystem 8
The Microsystem 10
Significance 21
Alternatives 26
Footnotes 30

III. CONCLUSIONS 31

APPENDIX

A. PATIENT QUESTIONNAIRE 34

B. PEDIATRIC SERVICES SELF-ASSESSMENT QUESTIONNAIRE . . . 37

C. EMERGENCY ROOM LOG EXTRACT 40

D. COMPARISON OF PEDIATRIC OUTPATIENT SERVICES PROVIDED BY 30 MILITARY MEDICAL FACILITIES 45

E. THE CHI-SQUARE TEST OF INDEPENDENCE FOR WAITING TIME AND ESCORT'S PERCEPTION 50

F. HISTOGRAMS OF ESCORTS' PERCEPTIONS VS ER WAITING TIMES 53

G. ER UTILIZATION BY CHILDREN 12 YEARS AND LESS 58

SELECTED BIBLIOGRAPHY 61

LIST OF TABLES

Table		Page
1.	Patient Questionnaire Results	11
2.	Patient Questionnaire Results (Narrative)	13
3.	Distribution of ER Waiting Time for Children 12 Years and Less	17
4.	Preferred Operational Hours for the Pediatric Clinic Indicated by Escorts	22
5.	Comparison of Alternatives to Criteria	27

LIST OF FIGURES

Figure		Page
1.	Age Distribution of ER Patients, 12 Years of Age and Less, Treated Monday - Friday	16

I. INTRODUCTION

PROBLEM DEVELOPMENT

There has been an increase in the demand for emergency room (ER) services, greater than other ambulatory services, since the late 1950's. For this reason, health care managers have directed increased attention to the role of the ER.[1] Hospital emergency rooms are being utilized by an increasing proportion of patients for the provision of non-urgent care of conditions traditionally brought to primary care physicians.[2,3,4,5,6] In effect, the ER in many cases is taking on the role of family physician.[7,8]

These same trends have taken place at Fort Sill, Oklahoma. Reynolds Army Community Hospital serves a population of approximately 66,000, which includes active military, dependents, and retired personnel. The hospital is presently operating at an authorized 166 beds, with a daily outpatient load from 1,100 to 1,500 visits. The outpatient visits to the ER for FY 1982 have been approximately 4,100 visits per month as compared to 3,600 visits per month in FY 1981.

The defined purpose of the ER at Reynolds Army Community Hospital (RACH) is to provide emergency medical care to save life, limb or prevent undue or prolonged suffering. It is stressed to patients, through the use of an ambulatory patient care information booklet which is included in the Fort Sill Welcome Packet, that the ER should not be used as an after-duty-hours outpatient or pediatric clinic for the treatment of minor problems. It is further emphasized that due to the current shortages of medical

personnel, staffing to provide other than emergency care is very limited. It is the hospital's policy that all personnel reporting to the ER will be evaluated, unless they leave before being seen. Waiting time is the cost a patient pays for utilizing the ER for minor non-emergency medical problems. Waiting time varies, depending on the ER workload, and has been reported in excess of six hours.

The ER is operated based on a three 8-hour shift schedule commonly referred to as days, evenings, and nights. It has been observed, by monitoring daily numbers of patients per shift for twelve weeks, that a trend of uneven distribution exists in the daily total number of patients treated per shift.

Many of the patients treated in the ER are children. During the hours that the Ambulatory Care Clinic (ACC) is operational (Monday-Friday, 0730-1630), patients over the age of 12 years with minor medical problems are directed to the ACC. Patients under the age of 12 years, reporting to the ER, are asked to make a same-day appointment (SDA) through central appointments for the pediatric clinic.

The uneven distribution of ER patients for the three shifts causes staffing problems, long waiting periods are experienced and at times patients feel frustrated and perceive they are being denied care. The ER's capability to render care would be enhanced if the numbers of patients per shift could be reduced. Alternative methods need to be developed to provide some of the services now being performed by the ER.

This study will focus on dependent children 12 years of age and less. The problem is to determine reasons why the children utilize ER services when they do. This will be done to determine the optimum method of providing the desired care within current resources for the children.

The research methodology for the problem consisted of literature review, perusal of ER logs, collection of data through the use of two questionnaires, and the analysis of the collected data to identify common trends and alternative methods. The first questionnaire, see Appendix A, allowed respondents to express their particular wants and perceptions in relation to the service. The questionnaire was given to the accompanying adult for completion in the pediatric clinic and ER waiting room. The completed questionnaires were turned in at the ER desk and the pediatric clinic's secretary's desk for collection. The second questionnaire, see Appendix B, was mailed to the Chiefs of Pediatric Services at thirty-one hospitals where Residents from the US Army-Baylor Program are located. The chiefs were requested to list current pediatric services and services they would like to see implemented at their facility. The Residents were asked to review the input for completeness and return the questionnaires by mail.

The data collected was utilized to define the common reasons for the current ER utilization trends among children 12 years and less, determine the implications, discuss alternative methods of providing the services to the child, and evaluate advantages and disadvantages of the present methods as well as the alternatives. The established criteria on which the alternatives were evaluated are:

1. Include policies which will tend to decrease the number of patients 12 years of age and less reporting to the ER which do not require immediate care.

2. Provide convenient operating hours for the users.

3. Be a same-day service.

4. Provide outpatient pediatric consultation services at all times.

5. Decrease waiting time to three hours or less in the ER.

The optimal solution is limited to one which can be supported utilizing current staffing levels and resources.

Currently at RACH, a pediatric patient can receive care from the pediatric clinic, a family practice physician, or the ER. Like most other military medical care facilities, appointments have to be scheduled weeks in advance due to the large volume of workload experienced. To provide more immediate care, same-day appointments are available and are scheduled using the central appointments system. When all the pediatricians and pediatric nurse practitioners are available, there are approximately 300 same-day appointments available per week in the pediatric clinic. The only source of pediatric care available after 1630 hours is that provided by the ER.

LITERATURE REVIEW

The literature review revealed that there has been very little research accomplished in the area of Emergency Room utilization and even less pertaining to pediatric patients. This finding was collaborated by Kleiman[9] and Weitzman[10] who both found the area to be bare of research.

It was evident in the few articles found, that there is the belief that ER's are being used primarily for the treatment of non-emergency conditions.[11,12,13,14,15] Many of the researchers believed that the ER has become the primary care provider or at least a substitute for the primary care provider.[16,17,18,19] Some believe the substitution is for the convenience of the physician[20,21] and is backfiring because more people are growing up without forming a link with a primary care provider, making the ER the physician's competition.[22]

Some researchers found that a major reason for ER utilization by adults and pediatric patients was their inability to access other alternative sources of care.[23,24] Another found just the opposite view, that utilization of alternate sources of medical care and ties to the medical system through a regular primary care physician increased use of the emergency room.[25] It may be part of today's environment where everything stays open late for convenience and the ER is perceived as being there for one's use.[26] It was found that patients use the ER based on their view of the medical problem, even if it was a common cold.[27] Another found, that for children, ER utilization was based more on the parent's inability to assess the medical condition and there was a fear of the condition becoming worse.[28] The inability to assess the problem appears to be more evident for younger children.[29,30]

Some of the proposed methods for solving the current ER utilization problems found in the literature varied dramatically. To reduce ER utilization, Health Maintenance Organizations in certain areas have added on an additional charge for visits to the ER which were non-emergency in nature.[31] Others have proposed that alternative sources of treatment be provided,[32,33] such as Emergicenters. Many support the proper channeling of patients through the use of triage.[34,35,36] Others believe the ER needs to be completely revamped so adequate staff, space, and equipment will be available to accommodate all those currently utilizing the ER.[37,38]

The literature review provided this writer with an understanding of the inadequate amount of research done to try to determine why people utilize the ER. It did, however, provide the necessary background needed to develop the methodologies for this study.

FOOTNOTES

[1]W. C. Stratmann, R. Ullman, "A Study of Consumer Attitudes About Health Care: The Role of the Emergency Room," Medical Care 13 (December 1975): 1033.

[2]Ibid, p. 1033.

[3]L. Kahn, M. Anderson, G. T. Perkoff, "Patient's Perceptions and Uses of a Pediatric Emergency Room," Social Science and Medicine 7 (1973): 155.

[4]M. B. Kleiman, "Who Uses the Hospital Emergency Room: Correcting a Misconception," Hospital and Health Services Administration 1 (1981): 63.

[5]M. Weitzman, M. S. Moomaw, K. P. Messenger, "An After-Hours Pediatric Walk-In Clinic for an Entire Urban Community: Utilization and Effectiveness of Follow-Up Care," Pediatrics 65 (May 1980): 964.

[6]L. Yoder, S. L. Jones, "Changing Emergency Department Use: Nurses' Perceptions and Attitudes," Journal of Emergency Nursing 7 (July/August 1981): 156.

[7]L. Prepon, "Are Doctors Making Emergency Rooms Their Competitors?" Physician's Management (November 1981): 58.

[8]S. M. Davidson, "Understanding the Growth of Emergency Department Utilization," Medical Care 16 (February 1978): 123.

[9]Kleiman, p. 65.

[10]Weitzman, p. 964.

[11]Yoder, p. 156.

[12]Kahn, p. 155.

[13]Weitzman, p. 964.

[14]Kleiman, p. 63.

[15]Stratmann, p. 1033.

[16]Prepon, p. 58.

[17]Weitzman, p. 965.

[18]Stratmann, p. 1035.

[19]L. L. Walker, "The Emergency Department as the Entry Point Into the Health Care System," Hospital Topics (March/April 1975): p. 46.

[20]Prepon, p. 58.

[21]Walker, p. 46.

[22]Prepon, p. 58.

[23]Stratmann, p. 1038.

[24]Davidson, p. 123.

[25]Kleiman, p. 68 and 69.

[26]Ibid, p. 69.

[27]Stratmann, p. 1042.

[28]Kahn, p. 157.

[29]Ibid, p. 157.

[30]Weitzman, p. 967.

[31]Prepon, p. 63.

[32]Ibid, p. 62.

[33]W. F. Hamilton, "Systems Analysis in Emergency Care Planning," Medical Care 12 (February 1974): p. 153.

[34]Ibid, p. 153.

[35]M. Averbush, "Reorganization of Emergency Room Triage at Womack Army Hospital," Military Medicine 148 (March 1983): p. 217.

[36]J. McGann, "Streamlining Helped DC General Cope With Wide Patient Mix," Emergency Department News (March 1982): p. 14.

[37]Stratmann, p. 1043.

[38]Yoder, p. 160.

II. DISCUSSION

THE MACROSYSTEM

To assess the pediatric services provided by the military, pediatric services self-assessment questionnaires (Appendix B) were mailed to thirty-one military hospitals for completion by Chiefs of Pediatric Services. Thirty questionnaires were completed and returned. The responses were provided by one Air Force, three Navy, and twenty-six Army medical treatment facilities. The information obtained is summarized in Appendix D.

The questionnaire was utilized to evaluate the methods used at the medical facilities to provide and schedule outpatient pediatric services. For this reason, the sources were requested to provide:

- Hours of operation for outpatient pediatric clinic.
- If pediatric sick-call is provided, with hours.
- If pediatric walk-in services are provided during normal hours.
- If pediatric same-day appointments are provided, with approximate wait.
- If TMC's are utilized by pediatric patients.
- If patient screeners are utilized by pediatrics.
- If a separate pediatric emergency service is provided, with hours.
- Special pediatric services provided by the medical facility for outpatients.
- Special services provided by Post which support pediatric services.
- Special services the chief would like to see his facility provide.

The only response that every medical facility had in common was that a pediatrician was on-call for the ER at all times. This seems to be the minimum requirement for providing emergency care for pediatric patients. The ER physician is able to telephonically consult with the pediatrician and in an emergency can have the pediatrician report to the ER. The next most common response dealt with having a separate pediatric ER. Three of the respondents, 10%, indicated the medical facility provided the service and twenty-seven, 90%, did not. Of the ten areas of concern in the questionnaire, providing a separate pediatric emergency service requires the most resources, time and personnel. It is of interest to note that one of the three positive responses was from an Army medical activity, indicating the service can be provided by that size organization. Twenty-six medical facilities, 87%, indicated that Troop Medical Clinics (TMCs) were not utilized to treat pediatric outpatients. The four, 13%, utilizing TMCs have large military populations, Fort Bragg, Fort Benning, Fort Hood, and Frankfurt, Germany. With the problems of limited space experienced by military medical facilities and large populations to support, better utilization of treatment space can be realized through the use of the TMCs for pediatric care. There are large blocks of time during the duty day when TMCs and their personnel are not efficiently utilized. These blocks of time can be used to schedule medical care for family members and as a minimum could be used as screening for same-day appointments to hospital clinics. Twenty-six of the medical facilities, 87%, indicated the use of same-day appointments for pediatric care. Only thirteen of the twenty-six, 50%, indicated that screeners were used by the pediatric clinic, thus opening the same-day appointment system to possible abuse. These results are better than overall where only 43% utilize screeners. This indicates that with the same-day appointment system there has been a realization

that screening is necessary. Eighteen of the medical facilities, 60%, indicated that pediatric sick-call hours were scheduled for their patients. Of these facilities, nine or 50%, indicated that walk-in service was not allowed. Only nine facilities provided pediatric sick-call on a walk-in basis. Six other medical facilities allowed walk-in pediatric service, for a total of fifteen facilities providing walk-in service or 50% of the surveyed medical facilities. Four of the medical facilities, 13%, provide weekend pediatric clinics; three, 10%, have evening hours (2030 and later); one, 3%, has a pediatrician in the ER (Mon-Sat) combined with 10% that have separate pediatric ERs indicates that 36% of the medical facilities provide pediatric services beyond those associated with the normal duty day, i.e. 0730-1630. Special services provided to pediatric outpatients by the medical facilities, special post services provided in support of outpatient pediatric care and outpatient pediatric care needs, as indicated by the chiefs of the pediatric services, are summarized in Appendix D.

THE MICROSYSTEM

To assess the pediatric outpatient services provided by Reynolds Army Community Hospital (RACH), patient questionnaires were provided in the pediatric clinic and the Emergency Room (ER). A total of 323 questionnaires, 131 from the ER and 192 from the pediatric clinic, were completed and evaluated. The results are summarized in Tables 1 and 2. The questionnaires (Appendix A) were developed to solicit the patient escort's perception of the current method of providing care, solicit suggestions for improvement of the current system, and to look for trends in why pediatric patients utilize the ER.

TABLE 1./PATIENT QUESTIONNAIRE RESULTS

	Results from ER Questionnaire		Results from PEDs Questionnaire		Combined Results	
	Number	Decimal Fraction	Number	Decimal Fraction	Number	Decimal Fraction
Aware of the same-day appointment (SDA)	86	.66	140	.73	226	.70
Not aware of SDA	45	.34	52	.27	97	.30
Aware of SDA and used it	76	.88	130	.93	206	.91
Aware of SDA but have not used it	10	.12	10	.07	20	.09
SDA waiting time was reasonable	53	.70	130	.93	183	.89
SDA waiting time was fairly long	15	.20	8	.06	23	.11
SDA waiting time was very long	8	.11	1	.01	9	.04
Have used Emergency Room (ER)	131	1.00	158	.82	289	.89
Have not used ER	0	.00	34	.18	34	.11
ER waiting time was reasonable	46	.35	49	.31	95	.33
ER waiting time was fairly long	32	.24	33	.21	65	.22
ER waiting time was very long	53	.40	76	.48	129	.45
Would have used SDA instead of ER if could get SDA	92	.70	156	.81	248	.77
Would not have used SDA instead of ER	39	.30	36	.19	75	.23

TABLE 1/PATIENT QUESTIONNAIRE RESULTS (Cont'd)

	Results from ER Questionnaire		Results from PEDs Questionnaire		Combined Results	
	Number	Decimal Fraction	Number	Decimal Fraction	Number	Decimal Fraction
Not aware of SDA that would have used SDA instead of ER	33	.73	41	.79	74 74	.76 .87*
Not aware of SDA that would not have used SDA instead of ER	9	.20	2	.04	11 11	.11 .13*
Not aware of SDA and did not respond to Questionnaire	3	.07	9	.17	12	.12
Ability to bring problem to medical attention ASAP	105	.80	166	.86	271	.84
Working parents not able to bring problem to medical attention ASAP	14	.11	10	.05	24	.07
Not able to bring problem to medical attention ASAP due to other reasons	12	.09	16	.08	28	.09
Total not able to bring problem to medical attention ASAP	26	.20	26	.14	52	.16
Transportation was a problem getting to hospital	20	.15	15	.08	35	.11
Have not used ER but have used SDA	0	.00	21	.62	21	.62

*Adjusted for no response to question

TABLE 2/PATIENT QUESTIONNAIRE RESULTS (NARRATIVE)

I. EMERGENCY ROOM SURVEY.

- Have on-call Pediatrician for ER.
- Have more Pediatricians in ER.
- Provide walk-in pediatric sick call.
- Triage and prioritize ER patients.
- Priority should be given to infants and children in ER.
- Increase the ER staff.
- Evening walk-in Pediatric Clinic (1700-2000).
- Get more nurses for ER.
- Improve Central Appointment System so you can get a Same-Day Appointment (more telephone lines and people).
- Provide more space and physicians for the ER.
- Have a separate minor emergency clinic.
- Bring in another physician to ER when an emergency case comes in.
- Physicians need to explain the child's condition to the parent better.
- Change the hours of the Pediatric Clinic, later hours.
- Get out more information on the transportation available to hospital.
- Keep the TMC's open later to reduce the ER workload.
- Make same-day appointments through the Pediatric Clinic, not CAS.
- Make more same-day appointments available.
- Have AMIC open later at night.
- Have Pediatrics open on Saturday, 1/2 day.
- Pediatrician full time in ER.
- Separate waiting area for children.
- Children should be seen before adults with same condition.

II. PEDIATRIC CLINIC SURVEY.

- See same physician (Peds) each visit.
- Improve Medical Records system, time to pick them up.
- Improve politeness of ER staff.
- More SDA.
- Make SDA through Peds Clinic
- Don't schedule Peds appointments before 0900.
- Get more Pediatricians.
- Have Pediatrician on call for ER.
- Have Pediatrician in ER 1700-2200.
- Try to decrease waiting times.
- Night Peds clinic.
- Make appointments through clinic.
- ER should take patients based on how sick they are, not by when they come.
- Physicians covering ER need Peds training; they treat children roughly and scare them.
- CAS needs more telephone lines and people.

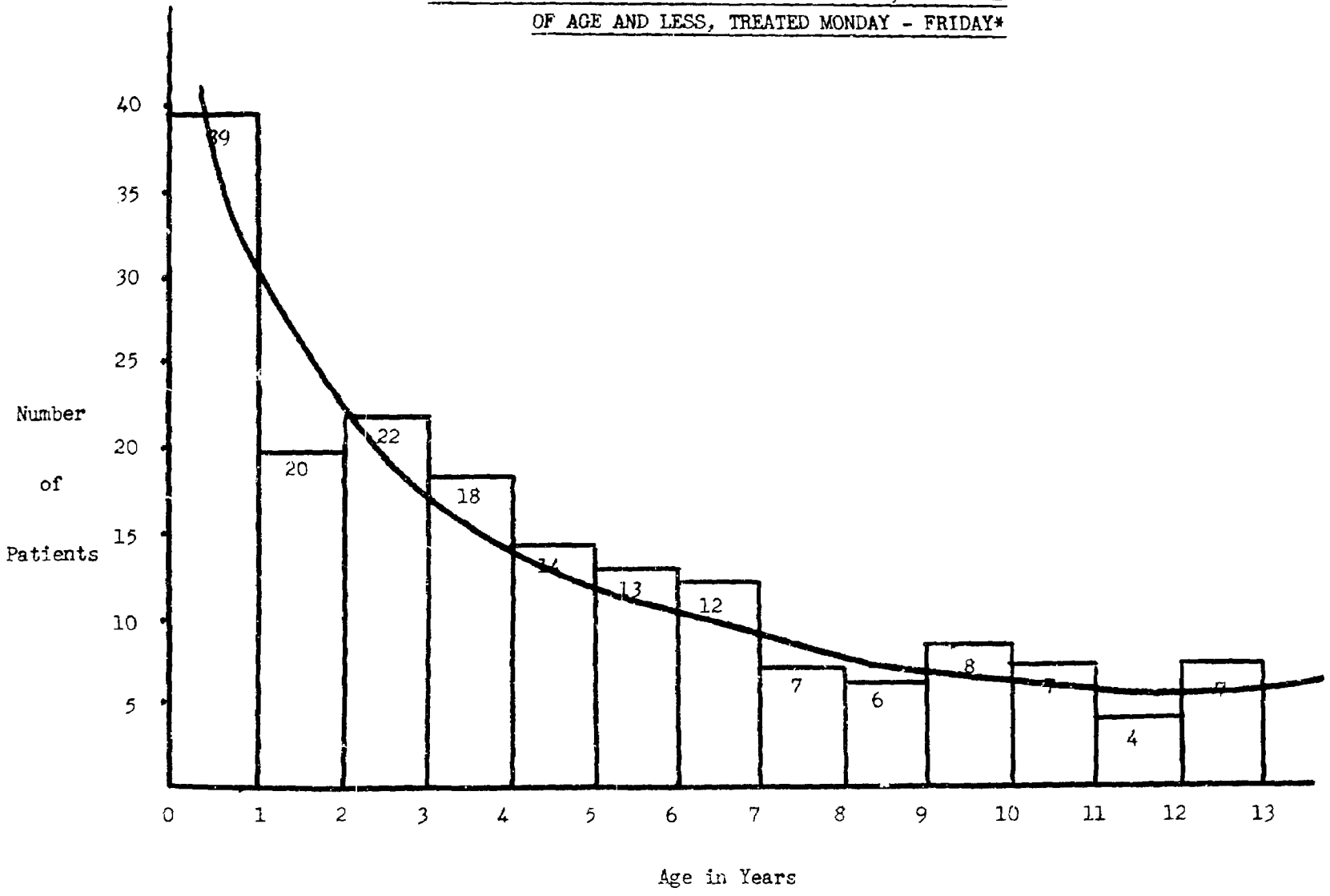
TABLE 2/PATIENT QUESTIONNAIRE RESULTS (NARRATIVE) (Cont'd)

- Ability to schedule return visit through clinic, not CAS.
- Play area for waiting children in Peds.
- Have AMIC operate until 2100.
- Morning Peds Walk-In Clinic - Sick Call.
- Well Baby Clinic.
- Special Ped. ER.
- Weekend Peds Clinic.
- Need an area to change diapers in hospital.
- Have medical records of people with appointments at the clinic.
- Publicize SDA - get the word out.
- Advise over the telephone.
- More positive attitude of employees.
- More time for appointment.
- Assign Pediatricians by unit, family practice concept.
- More concerned attitude.

The ER log for the first week of February was analyzed to determine the distribution by age of patients visiting the ER. The curvilinear relationship is represented by Figure 1. For the population of children being evaluated, 12 years of age and less, 56% of the ER visits are for children less than 4 years of age. Of all the ER visits for the evaluated age group, 42% were brought to the ER for an elevated temperature or cold symptoms (Appendix C). This relates to the Kahn, et al. findings that 34% of the escorts were unable to identify the degree of severity of the child's illness and that 63% brought their child to the ER because they were concerned the condition was becoming worse.[1] The age distribution depicted in Figure 1 also agrees with the Kahn, et al. finding that older children were more often thought to have come to the ER for appropriate reasons.[2] The older the child, the more experience the parent has in diagnosing and determining appropriate utilization of emergency services. It was also noted that 56% of the escorts were in the pay grade of E-6 and above. This observation is in line with that of M. Kleiman who found that persons who have established ties with the health care system, have a regular provider and readily seek out medical care, are the most likely to utilize the ER.[3]

This study was brought about due to the observed crowded conditions and suspected long waiting times experienced by pediatric patients in the ER of RACH. A study of the waiting times for the month of February 1983, for children age 12 years and less, was conducted (Table 3). The times recorded were the waiting times the escorts indicated they had waited in the ER prior to the child being seen. Of the 323 escorts surveyed, 289 indicated that they had utilized the ER (89% of the sample). As can be seen in Table 3, 31% of the pediatric patients wait three or more hours and 15% wait four or more

FIGURE 1/AGE DISTRIBUTION OF ER PATIENTS, 12 YEARS OF AGE AND LESS, TREATED MONDAY - FRIDAY*



*Info from 1st week, February 1983

TABLE 3/DISTRIBUTION OF ER WAITING TIME FOR CHILDREN 12 YEARS AND LESS

Hours	ER Survey		Peds Survey		Combined		Cumulative Percentage
	Number	Decimal Fraction	Number	Decimal Fraction	Number	Decimal Fraction	
0-.49	10	.09	19	.13	29	.11	.11
.5-.99	15	.14	20	.14	35	.14	.25
1-1.49	16	.15	15	.10	31	.12	.37
1.5-1.99	6	.06	15	.10	21	.08	.45
2-2.49	20	.19	18	.12	38	.15	.60
2.5-2.99	10	.09	13	.09	23	.09	.69
3-3.49	9	.08	15	.10	24	.09	.78
3.5-3.99	6	.06	10	.07	16	.06	.84
4-4.49	9	.08	12	.08	21	.08	.92
4.5+	7	.06	11	.07	18	.07	1.00

Information from February 1983

hours during a visit to the RACH ER. Only 45% of the pediatric patients are seen in less than two hours.

The waiting times and the percent seen in a block of time mean nothing without knowing the escort's perception of the ER wait. Escorts were asked to indicate, along with the time they had waited, their perception that the time waited was reasonable, fairly long, or very long. The results from those sampled in the ER and the pediatric clinic were similar. The combined results indicated that 32% perceived the wait as reasonable, 22% fairly long, and 44% very long. The indicated ER waiting times and the escort's perceptions were evaluated to determine if there was a relationship between them or if the results had no relationship. To evaluate the results, the chi-square test of independence using a .005 level of significance was performed, see Appendix E. The results indicated that the hours waited in the ER and the escort's perceptions were dependent. The calculated X^2 of 188.11 greatly exceeded the standard of 29.819, indicating a high degree of dependency. To better evaluate the relationships, histograms were made to compare the time waited in the ER and the escort's perceptions, see Appendix F. The relationships between ER waiting time and escort's perception are clearly evident in the histograms. It appears from the histograms that keeping the ER waiting time to two hours or less would greatly improve the perception of the services in the ER.

To determine the degree to which the pediatric patients contribute to the ER workload,the ER logs for the month of February 1983 were evaluated, see Appendix G. Children, 12 years and less, account for 36% of the ER's total workload. They account for 35% of the workload from 0001-0730 hours, 33% from 0731-1630 hours, and 39% from 1631-2400 hours. More important is

the fact that 49% of all the ER visits by children 12 years and less are between the hours of 1631-2400 and 58% are between 1631-0730 hours. This is compared to the Kahn, et al. finding that 62% of the pediatric visits were made between 1600 and 2359 hours. As noted by Kahn, more visits were made on Saturdays and Sundays than on weekdays.[4]

The escorts were questioned on their ability to bring their child's condition to medical attention as soon as possible. This was done to determine if ER utilization was based on the escort's inability to access the medical system. The combined results indicated that 83% of the escorts were able to bring their child's condition to medical attention as soon as possible. It should be pointed out that only 80% of the escorts from the ER setting responded positively to this question as compared to 86% from the pediatric clinic, indicating more of an inability for those using the ER. It was found that of those escorts questioned in the ER, 20% were not able to bring their child's condition to medical attention as soon as possible. Of these, 54% was due to both parents working or 11% of the total escorts questioned in the ER. This is compared to only 5% indicating a problem due to both parents working from those escorts questioned in the pediatric clinic. This indicates that two times more families with both parents working utilize the ER as their medical pediatric source than utilize the pediatric clinic. When asked if transportation had been a problem getting to the hospital, 15% of the escorts questioned in the ER indicated that transportation was a problem compared to 8% questioned in the pediatric clinic. This indicates that escorts with transportation problems are more inclined to utilize the ER for pediatric services than the pediatric clinic. The primary reasons given by the escorts for the transportation difficulties

were that the family had no automobile, the family had only one automobile and the husband drove it to work or the wife could not drive. The combined results indicate that 11% of all the escorts had transportation problems.

Like 87% of the other military medical facilities surveyed, listed in Appendix D, RACH has a same-day appointment (SDA) system for the pediatric clinic. The SDA system was initiated to provide same-day pediatric care for patients with minor illnesses and to reduce the ER workload. It is felt that if an escort can get a scheduled appointment with a pediatrician on the day of the child's medical condition, that the escort will be less likely to utilize the ER as the treatment source. To determine if a lack of knowledge about the SDA system contributed to ER utilization, escorts in the ER and the pediatric clinic were asked if they were aware of the SDA system. It was found that 73% of the escorts from the pediatric clinic and 66% from the ER were aware of the SDA system. Overall, 70% of the escorts were aware of the SDA option. Of those escorts aware of the SDA system, 88% of the escorts surveyed from the ER had utilized the SDA and 93% from the pediatric clinic. These high percentages indicate that knowing about the SDA system fosters its utilization. Of the 30% indicating they did not know about the SDA system, 87% indicated that they would have used the SDA instead of a visit to the ER if they had known about the SDA system for the pediatric clinic. This response indicates that if the escorts are made aware of the SDA system for the pediatric clinic, they will use it instead of the ER. It appears that getting the information about the SDA option out to the escorts will reduce ER utilization.

The escorts were asked if they would have used the SDA option instead of the visit to the ER, if they had known you could get an appointment the same day. The combined response from the ER and pediatric clinic indicated that 77% of the escorts would have used the SDA system instead of a visit to

the ER. Knowing you can get an appointment is the important point. The 23% that indicated that they would not have utilized the SDA were asked the reason why not. Their responses fell into three categories: 1. The child's condition was an emergency. 2. The child's condition developed after pediatric clinic hours or on the weekend. 3. Tried to make a SDA but none were available or couldn't get central appointments because the line was always busy. The escorts that had utilized the pediatric SDA were asked their perception of the waiting time. When looking at the combined results, 89% of the escorts indicated the waiting time was reasonable as compared to only 33% for an ER visit. It appears that if more of the escorts utilized the SDA option instead of an ER visit, escorts' perceptions of the pediatric care system would increase.

The escorts were also asked what would be the most convenient nine-hour block of time to them for operation of the pediatric clinic, see Table 4. Two blocks of time accounted for 91% of the responses, 63% for 0830-1730 hours and 28% for 0730-1630 hours.

SIGNIFICANCE

The survey of the macrosystem provided information about the methods utilized by other medical facilities to provide pediatric care. It is apparent, when comparing the methods utilized to provide pediatric services at Reynolds Army Community Hospital (RACH) with other methods found in the system, that RACH could be more innovative. Innovative in the sense that there are other methods that can compliment or supplement a pediatric clinic. The use of the family practice service or a visit to the ER are the current alternatives to the pediatric clinic at RACH. Since it is equally difficult to get

TABLE 4/PREFERRED OPERATIONAL HOURS FOR THE PEDIATRIC CLINIC INDICATED BY ESCORTS

	ER		Peds Clinic		Combined	
Operational Hours	Number	Decimal Fraction	Number	Decimal Fraction	Number	Decimal Fraction
0730-1630	21	.2143	50	.3205	71	.2795
0830-1730	66	.6735	94	.6026	160	.6299
0900-1800	3	.0306	9	.0577	12	.0472
0800-1700	3	.0306	1	.0064	4	.0157
0930-1830	1	.0102	3	.0192	4	.0157
Other	5	.0510	0		5	.0197

an outpatient appoirtment with the family practice service as it is with the pediatric service, a visit to the ER is the most likely alternative for pediatric care. Convenience plays some part in the decision; however, more important is the parent's desire to see that the child receives care so that the condition doesn't become worse. Kahn, et al. found that 63% of the ER visits were due to the escort not wanting the condition to become worse and only 18% believed their child's condition was an emergency.[5] "The physician caring for a child in this setting usually does not know the child or his family and is placed at a disadvantage in understanding the long-term implications, both medical and psychosocial, of this or any other acute or chronic illness. By working under time constraints and with incomplete data base, the physician is usually limited to the practical concerns of diagnosing and treating the particular episode that brought the child to the emergency room."[6] It appears that when alternatives are considered to the current RACH system, emphasis should be placed on providing pediatric care in a location other than the ER whenever possible.

The results of the RACH study indicate that parent education may be a means of reducing pediatric ER utilization. Kahn, et al.[7] and Weitzman, et al.[8] found that escorts have difficulty identifying the degree of severity of a child's illness and that older children are more often brought in for appropriate reasons. The RACH finding that 56% of the children utilizing the ER were less than four years of age and that 42% of the complaints were elevated temperature and cold symptoms support their findings. This information, combined with the observation that 56% of the escorts were in the pay grade of E-6 and above, indicating an established tie to the military medical system, supports the concept that parent education could reduce pediatric ER utilization. The RACH pediatric service currently produces a pediatric handbook for

the non-pediatrician who cares for children in both the ER and the family practice clinic. This concept should be taken a step further to include a parent's pediatric handbook which provides information and advice. It could explain treatments for minor illnesses and give guidance about symptoms which indicate the child should be seen by a physician. By knowing what to do based on the guidance provided, more parents should be able to at least control the child's symptoms until a same-day appointment can be made and not resort to a visit to the ER.

The same-day appointment (SDA) was found to be a very important element in the provision of pediatric services at RACH. It also impacts upon ER utilization by pediatric patients. It was stated by 77% of all the escorts that they would have utilized a pediatric SDA instead of a visit to the ER, if they had known about the SDA system r they could have arranged for a SDA. Two important conclusions evolve from this fact. The first is that the SDA system needs to be better publicized. Of the 30% indicating they did not know about the pediatric SDA system, 87% stated they would have utilized the SDA option instead of an ER visit if they had known about the SDA. This could reduce the ER pediatric workload by an estimated 26%. This brings the second conclusion which is also required to compliment the first. The SDA system must be made more accessible and an increased number of appointments made available. Of the 70% aware of the SDA system, 77% stated they would have utilized the SDA option instead of an ER visit if they could have gotten a SDA. This could reduce the ER pediatric workload by an estimated 54%. The combination of more publicity and availability of SDA's has the potential of reducing the ER pediatric workload by 70%. Availability includes an increased number of SDA slots and accessibility. Accessibility is currently through the central appointment system (CAS). The

congestion of the CAS causes many escorts to become frustrated and eventually resort to an ER visit for the child's condition. Bookings for a pediatric SDA should be made directly with the pediatric clinic. This would be an appropriate time to have/implement telephonic screening of SDA requests, thus better insuring the appropriateness of a SDA request. When appropriate, advice could be given telephonically, eliminating the need for a SDA and could be logged as a telephone consult for workload data. By increasing availability and improving accessibility, the aforementioned reduction of 70% pediatric ER workload would reduce the entire ER workload by 25%.

When the escorts were asked about the pediatric clinic hours, 72% indicated a desire for different hours. However, 90% of the escorts' desires could be met by keeping the pediatric clinic open an additional hour, 0730-1730 hours. This additional hour could be used to provide more SDA slots and provide an opportunity for families with working parents to bring their children to the pediatric clinic instead of the ER. Currently, 11% of the pediatric escorts surveyed in the ER indicated that both parents worked. Transportation was also a problem indicated by the survey. Keeping the pediatric clinic open an hour later would provide those families with only one automobile an opportunity to use the pediatric clinic instead of the ER. Transportation is an area that the Post needs to assess to determine if there is an actual transportation problem or just an awareness problem.

The primary problem associated with pediatric care in the ER, as far as the escorts are concerned, is the waiting time. The results of the questionnaires indicated that 45% of the pediatric patients were seen in less than two hours, 69% in less than three hours, 79% in less than 3.5 hours, and 85% in less than four hours. The analysis of escorts' perceptions of ER waiting time

indicated that 67% of the escorts felt the waiting time was less than reasonable. To improve the escorts' perception of the ER, waiting time should be kept to two hours or less. By initiating the recommended changes mentioned previously, some of the pediatric ER workload will be reduced, thus causing some reduction in waiting time. During the survey of the ER, it was found that the previously utilized triage section and prioritization of patients had been eliminated.[9] Patients are basically being seen depending on when they report to the ER with the exception of "bona fide" emergencies. This practice needs to be changed. Immediate triage upon reporting to the ER needs to be initiated. Weitzman, et al. found that 28% of the parents in their study underestimated the severity of their child's illness.[10] A prioritization plan needs to be reestablished which insures that children and sick infants are seen before adults with non-emergency medical problems.

ALTERNATIVES

There are four alternatives which can be utilized to respond to the problem of pediatric ER utilization for non-emergency conditions. The alternatives are (see Table 5):

1. Change the pediatric service so that it can accommodate all pediatric care with the exception of emergencies.

2. Change the emergency service so that it can accommodate all the patient load it is currently experiencing and improve patient perceptions.

3. Moderately change both the pediatric service and emergency service.

4. Change nothing, keep the current system for providing pediatric care.

The advantages of alternative one, changing the pediatric service so that it can accommodate all pediatric care with the exception of emergencies,

TABLE 5/COMPARISON OF ALTERNATIVES TO CRITERIA

Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Decrease the numbers of patients being seen in ER	Yes	No	Yes	No
Convenient hours for the patients	Yes	Yes	Yes	No
Same day service	Yes	Yes	Yes	Not always
Outpatient pediatric consultation at all times	Yes	Yes	Yes	Yes
Decrease waiting time to three hours or less	Not always	Yes	Not always	No
Utilize current staff levels	No	No	Yes	Yes
Utilize current resources	No	No	Yes	Yes

would be that the new system could be developed, staffed, and operated so that there would be no need for non-emergency pediatric patients to utilize the ER. To insure service, a section of the pediatric service would have to be staffed with a physician on a twenty-four hour basis. This would provide both convenient hours for the patients and same-day service. The disadvantages associated with the alternative are, there would still be a possibility that waiting times could be in excess of three hours, depending on the types of conditions seen and the distribution of patient arrivals. To provide the twenty-four hour operation required by this alternative, staffing levels would have to be increased. The primary problem would be the additional requirements for physicians to cover the evening and night shifts. Additionally, monies would have to be provided for additional staff or other areas of the hospital would have to give up their staff. There is a possibility that the evening and particularly the night staff would not be utilized efficiently.

Alternative two, change the emergency service so that it can accommodate all the patient load it is currently experiencing and improve patients' perceptions, would provide convenient hours for the users in that the ER is operational on a twenty-four-hour-a-day basis. Same-day services would be provided and there would be outpatient pediatric consultation available at all times. This would be the only alternative which would positively reduce ER waiting time to less than three hours. This could be insured through proper staffing, equipping, and contingencies for back-up support so that waiting times would not exceed certain parameters. The alternative would not reduce the numbers of patients utilizing the ER as their treatment source. It may in fact, due to the reduced waiting times, increase the utilization of the ER.

Staffing levels for the ER would have to be at least doubled during the evening shift and possibly into the night shift. More space would be required to accommodate the additional staff and money would be needed to hire them. Staff could be taken from other areas in the hospital; however, this would only increase the backlog of appointments in the respective area.

The advantages of alternative three, moderately changing both the pediatric service and emergency service, are it could reduce the numbers being seen in the ER. This would be done through increasing availability and improving accessibility of the pediatric same-day appointment system. This could reduce the entire ER workload as much as 25%. Convenient hours for the patients would be provided. The ER would be operational twenty-four hours a day and the pediatric clinic's hours would be extended to accommodate working parents, families with only one automobile, and more SDA bookings. Same-day service would be enhanced in the pediatric clinic because of its extended hours of operation and the ER would be available as a back-up option. On-call pediatric consultation would be available at all times. With the reduction of pediatric ER utilization and triage/prioritization of patients entering the ER, children and infants being seen before adults with non-emergency conditions, there is a possibility that ER waiting time could be kept below three hours for pediatric patients. This system would operate utilizing the staff and resources currently available.

The fourth alternative, leaving the system the way it is, does nothing to solve the current problems. The ER would still be mis-utilized, escorts would feel frustrated due to the long ER waiting times, there would not be adequate numbers of same-day appointments and they would have to be made through a CAS which is inadequate.

FOOTNOTES

[1]L. Kahn, et al., "Patients' Perceptions and Uses of a Pediatric Emergency Room," Social Science and Medicine 7 (1973): p. 156 and 157.

[2]Ibid, p. 157.

[3]M. B. Kleimann, "Who Uses the Hospital Emergency Room: Correcting a Misconception," Hospital and Health Sciences Administration 1 (1981): p. 69.

[4]Kahn, p. 156.

[5]Kahn, p. 156.

[6]M. Weitzman, et al., "An After-Hours Pediatric Walk-In Clinic for an Entire Urban Community: Utilization and Effectiveness of Follow-Up Care," Pediatrics 65 (May 1980): p. 964.

[7]Kahn, p. 157.

[8]Weitzman, p. 969.

[9]Interview with Frank B. Parks, Captain, Medical Corps, OIC, Emergency Room, RACH (March 1983).

[10]Weitzman, p. 969.

III. CONCLUSIONS

The research problem was to determine reasons why children less than the age of twelve utilize ER services when they do. This was done to determine the optimum method of providing the desired care within current resources for the children.

The reasons identified during the research for children utilizing the ER when they do are:

1. Convenience, this is however balanced against the known long wait.

2. The inability to bring the child's condition to medical attention as soon as possible due to both parents working.

3. The inability to bring the child's condition to medical attention as soon as possible because of transportation difficulty.

4. The escorts were not aware of the more convenient alternative, same-day appointments.

5. The alternative, SDA, was not accessible due to all appointments being scheduled or problems due to the central appointment system.

6. The inability of escorts to assess the severity of the child's illness.

7. The child's condition was an emergency.

The optimum solution is to moderately change the pediatric service and the emergency service. The pediatric service would be changed by extending its operation until 1730 hours instead of 1630 hours. This would

provide more SDA's and allow working parents and those with transportation problems to use the pediatric clinic. SDA's would be made by calling the pediatric clinic, doing away with the problem caused by the CAS and providing the opportunity for pediatric personnel to screen/telephone triage requests for SDA's. The pediatric service will produce a pediatric booklet for parents providing guidance and minor treatments to enhance the parent's ability to assess the severity of their child's illness. The SDA system will be better publicized so that parents will know there is a more convenient option than visiting the ER. The ER, due to the above changes, will experience reduced utilization by pediatric patients. The ER will initiate immediate triage upon a patient's arrival and all patients will be prioritized. Infants and children will be prioritized to receive care before adults with non-emergency conditions. The reduced numbers of pediatric patients utilizing the ER and the prioritization system should dramatically reduce ER waiting times for pediatric patients.

Getting the information out to the parents is the key to the success of the changes. The hospital public affairs officer (PAO) should arrange for the information to be placed in the Post newspaper and run at predetermined intervals to acquaint new arrivals and remind others. The PAO should coordinate the development and printing of a patient information booklet to inform patients about services provided and general information about RACH. Information about the changes in the pediatric service and the ER should be included in all of the PAO's newcomer briefings.

The research showed that knowing about the SDA leads to high utilization of the SDA system. With more SDA slots available and enhanced awareness of the SDA system, utilization of the SDA option will increase and

utilization of the ER by pediatric patients will decrease. This should cause the escort's perception of the pediatric services provided by RACH to increase and promote a more efficient operation in the ER and pediatric clinic.

It is recommended that Fort Sill evaluate current transportation availability since it was identified as a problem. The Post should also encourage sponsors to bring their family members for care as soon as possible and not utilize the ER for non-emergency conditions. Commanders should be advised to release personnel to transport their dependents to the hospital when required.

APPENDIX A

PATIENT QUESTIONNAIRE

PATIENT QUESTIONNAIRE

This questionnaire is anonymous. please do not indicate your name.

A special study is being conducted in an effort to analyze the pediatric system utilized by your child.

1. Date/Time_____ 2. Location ☐ Emergency Room ☐ Pediatric Clinic

3. What would be the most convenient hours of operation for you of the Pediatric Clinic? (in a 9-hour block, i.e. 0730-1630, 0830-1730, etc.)

4. Were you aware of the same-day appointment system for the Pediatric Clinic?

☐ Yes ☐ No

If Yes, have you ever used the same-day appointment system?

☐ Yes ☐ No

If Yes, how long did you have to wait to be seen?

_____

What is your opinion about the waiting time for the same-day appointment system?

☐ a. The waiting time was reasonable.

☐ b. My child had to wait a fairly long time before being seen.

☐ c. My child had to wait a very long time before being seen.

5. Are you now or have you ever used the Emergency Room to provide care for your child?

☐ Yes ☐ No

If Yes, what was the approximate waiting time at the ER? _____

Appendix A

FSMEDDAC Form 114 (OT)
1 Feb 83

PATIENT QUESTIONNAIRE (Cont'd)

What is your opinion about the waiting time in the ER?

[ ] a. The waiting time was reasonable.

[ ] b. My child had to wait a fairly long time before being seen.

[ ] c. My child had to wait a very long time before being seen.

Would you have used the same-day appointment instead of the visit to the ER, if you had known you could get an appointment the same day?

[ ] Yes [ ] No

If No, why? _____

_____

6. Were you able to bring your child's problem(s) or condition(s) to medical attention as soon as possible?

[ ] a. Yes

[ ] b. No, because both parents work and the problem began after parents reported to work.

[ ] c. No, because of some other reason (Please explain)_____

_____

7. Did you have any transportation difficulties getting to the hospital?

[ ] a. No

[ ] b. Yes, please explain _____

_____

8. Do you have any suggestions how the pediatric services for your child could be improved or made more convenient? (If necessary, use back of page.)_____

_____

APPENDIX B

PEDIATRIC SERVICES

SELF-ASSESSMENT QUESTIONNAIRE

PEDIATRIC SERVICES
SELF-ASSESSMENT QUESTIONNAIRE
FOR COMPLETION BY
CHIEF, PEDIATRIC SERVICES

1. What are the hours of operation for your outpatient pediatric clinic?

_____

2. Do you have scheduled pediatric sick-call hours?

☐ Yes ☐ No

If yes, what are the hours?_____

3. Do you have pediatric service on a walk-in basis during normal hours of operation?

☐ Yes ☐ No

If No, why?_____

_____

4. Do you have a same-day appointment system for pediatric patients at your facility?

☐ Yes ☐ No

If No, why?_____

If Yes, approximately how long is the wait?_____

5. Are TMCs utilized by pediatric patients at your post or base?

☐ Yes ☐ No

6. Does your service screen patients to determine if their needs can be met by a non-physician?

☐ Yes ☐ No

If Yes, what are the qualifications of screener? _____

_____

Appendix B

PEDIATRIC SERVICES SELF-ASSESSMENT QUESTIONNAIRE (Cont'd)

7. Do you have a separate emergency pediatric service?

☐ Yes ☐ No

If Yes, what are hours of operation?_____

If No, do physicians in the ER have pediatric consultation available on-call at all times?

☐ Yes ☐ No

8. What special services are provided by your facility in support of pediatric outpatients? (Use back of page, if necessary.) _____

_____

_____

9. What special services would you like to see your facility provide in support of pediatric outpatients? (Use back of page, if necessary.) _____

_____

_____

10. Does the Post or Base on which your facility is located provide any special services in support of the pediatric service (i.e. transportation, child care, etc.)?

☐ Yes ☐ No

If Yes, what are the services provided? _____

_____

_____

APPENDIX C

EMERGENCY ROOM

LOG EXTRACT

APPENDIX C_ ER LOG EXTRACT

Day of week	Age	Time	Rank	Complaint
Tues	3	0052	O2	+Temp,cough
"	8/12	0132	E5	+T
"	6	0403	E5	+T
"	19/12	0805	O3	+T,vom,cong
"	10	0917	E5	Asthmatic
"	18/12	0937	O3	Diarrhea
"	2	0944	E3	+T
"	3 1/2	1056	E6	Vomit
"	1/12	1131	E5	Inj. to forehead
"	18/12	1435	E7	+Temp
"	4	1535	E8	Vomit
"	5	1605	E5	Inj. to groin
"	2	1612	E5	Back inj.
"	9	1642	E1	Rect. bld.
"	6/12	1716	O1	Cold sympt.
"	5	1732	E6	Cold sympt.
"	4/12	1739	O3	+T
"	6	1741	E3	R hand inj.
"	4	1746	O3	Ear inf.
"	12	1754	E3	+T
"	8/12	1755	O3	Vomit
"	10	1756	E6	Cold sympt.
"	9	1756	E6	Cold sympt.
"	12	1756	E6	Cold sympt.
"	3	1805	E1	Cong,rash
"	7	1838	E3	+T
"	5	1857	E6	Suture removal
"	7	2008	E6	+T
"	3	2008	E6	+T
"	6/12	2149	E4	Diarrhea
"	3	2200	E6	Rash
"	2	2203	E3	R & L eye inf.
"	3	2225	E6	Earache,vomit
"	5	2306	E4	Vomit
"	3	2312	E4	+T
Wed	8/12	0105	EC	Prob. breathing
"	11	0142	CW3	Ear pain
"	11/12	0651	E6	+T
"	4	0700	E5	Asthmatic
"	3	0800	E5	Ingested camp.
"	12	0927	E6	Vomit,dia.
"	9	0950	E7	Chest pain
"	1	1030	O3	+T
"	1	1042	E4	+T
"	3	1056	E5	+T
"	6	1122	E6	+T
"	10/12	1135	O3	Inj. above R eye
"	6/12	1221	E1	Burn
"	2/12	1302	E5	Burn
"	5	1302	E4	Nose bld.
"	6	1326	E4	+T

APPENDIX C -

ER LOG EXTRACT (Cont'd)

Day of week	Age	Time	Rank	Complaint
Wed	6	1329	E6	+T
"	9	1333	E6	SOB
"	5	1441	E7	+T
"	4	1546	O1	+T
"	8	1551	E6	Fluid behind ear
"	11	1626	E6	+T
"	8	1630	E7	Ringworm
"	13/12	1636	E4	Fell down stairs
"	3	1643	O1	Cough
"	4	1703	E4	Ing. vitamins
"	2	1703	E4	Ing. vitamins
"	9	1730	O3	Meds.
"	2	1736	E4	Cough
"	5	1740	E4	R eye inj.
"	6	1740	E5	Cough
"	10/12	1814	E5	Head inj.
"	4	1817	E7	Head inj.
"	14/12	1845	O1	+T
"	4	1854	E6	+T
"	5	1854	E6	+T
"	3	1903	E6	+T
"	6/12	1935	E8	Not eating
"	2	1939	E7	Head inj.
"	3	1949	E6	+T
"	3	1951	E6	+T
"	16/12	2040	E5	Head inj.
"	11/12	2049	O2	Vomit
"	7/12	2126	E7	+T
"	6	2136	E7	+T
"	10/12	2224	O3	Vomit,dia.
"	2	2231	E5	R eye
"	7	2304	E5	+T
"	1/12	2310	E5	Prob. bowel move.
Thur	8 days	0022	E2	Ab. pain
"	11	0115	E6	React. to aspr.
"	6 days	0137	O3	Ambilical prob
"	2	0208	E4	Cold sympt.
"	5/12	0238	E3	Cough
"	10/12	0255	E4	Congested
"	3	0305	E5	+T
"	2	0728	O3	Seizure
"	4	0845		+T
"	2	1028	E1	Drk. lysol
"	2	1104	O3	Suture removal
"	6/12	1137	E1	Dressing ch.
"	3	1223	O1	+T
"	4	1435	E4	Abd. pain
"	4	1448	E7	Dog bite
"	11	1512	E6	Ing. small pins
"	9	1517	E7	Cold
"	8/12	1535	E5	+T

APPENDIX C -

ER LOG EXTRACT (Cont'd)

Day of week	Age	Time	Rank	Complaint
Thur	6	1547	E6	Cold
"	8	1557	O3	Ear drainage
"	10	1600	E7	Lac. to head
"	16/12	1615	E2	Cold
"	10	1619	E7	Suture removal
"	5	1647	E4	Nose inj.
"	4	1726	E5	Blister in mouth
"	13/12	1728	O2	+T
"	6	1739	E7	Cold
"	4	1745	E6	Lac. tongue
"	21/12	1749	E7	Rabies shot
"	4	1805	O3	+T
"	11/12	1829	E6	Cold
"	5	1839	E6	Poss. strep
"	10/12	1845	O2	Ear inf.
"	9	1851	E6	Need ring cut
"	12	1901	E7	Earache
"	7	1905	E5	Bleeding rectum
"	5	1916	E6	Head lac.
"	2	1935	E5	Lac. above eye
"	2	1941	E5	+T
"	2/12	1951	E9	Cold
"	7	1957	O3	Abd. pain
"	1	2040	E5	Ear draining
"	10/12	2103	E6	+T
"	7	2121	E6	+T
"	3	2140	E4	Earache
"	18/12	2249	E6	+T,vomit
"	2/12	2259	E1	Cold
"	7	2311	E6	+T
Fri	7 days	0022	E1	Aspirated on formula
"	16/12	0032	E6	+T
"	3	0040	E6	+T
"	18/12	0218	E8	Not eating
"	35 days	0309	E6	Congestion
"	4	0549	E6	+T
"	6	0751	E7	Suture removal
"	8	1025	E5	Chest pain
"	12	1145	E5	Inj. to nose
"	2	1258	E1	Poss. UTI
"	5/12	1258	E1	Cold
"	2	1307	E6	Cold,abd. pain
"	1	1310	E6	Diarrhea
"	5	1312	E8	+T,vomit
"	6	1334	CW2	Cold,sore throat
"	7/12	1342	O3	+T
"	2	1405	E4	Vomit
"	13/12	1405	E4	Vomit
"	8/12	1418	E4	Inj. arm
"	2	1422	E6	Fell down steps
"	5/12	1451	O3	Cold
"	10	1455	E6	+T,earache
"	2	1520	E3	Lac. forehead

APPENDIX C -
ER LOG EXTRACT (Cont'd)

Day of week	Age	Time	Rank	Complaint
Fri	2	1525	O1	Nose bleed
"	2	1535	E5	+T,earache
"	3	1540	E4	+T
"	10	1548	E6	Hives
"	12	1600	E6	Cat bite
"	12	1603	E8	Asthma
"	9	1615	E6	Nose bleed
"	5/12	1715	E3	+T,vomit
"	8	1717	E5	+T,cough
"	8	1749	E9	Chest pains
"	19/12	1820	O3	Cough
"	1/12	1841	E1	Refuses to eat
"	1	1841	E5	Vomit
"	2 6/12	1906	E6	Runny nose
"	1 2/12	1916	E6	Poss. ear inf.
"	6/12	1928	E3	Cold
"	2 6/12	2000	E5	+T
"	5	2107	E5	Earache
"	22/12	2135	WO1	Swollen ear
"	6	2230	E6	Cough,earache
"	10	E7	+T	

APPENDIX D

COMPARISON OF PEDIATRIC OUTPATIENT SERVICES PROVIDED BY 30 MILITARY MEDICAL FACILITIES

APPENDIX D - COMPARISON OF PEDIATRIC OUTPATIENT SERVICES PROVIDED BY 30 MILITARY MEDICAL FACILITIES

HOSPITAL LOCATION	PEDIATRIC CLINIC HOURS	PEDIATRIC SICK-CALL YES	PEDIATRIC SICK-CALL NO	PEDIATRIC WALK-IN YES	PEDIATRIC WALK-IN NO	PEDIATRIC SDA YES	PEDIATRIC SDA NO	APPROXIMATE WAIT SDA	UTILIZATION OF TMC's YES	UTILIZATION OF TMC's NO	PATIENT SCREENERS	PEDIATRIC ER YES	PEDIATRIC ER NO	PEDIATRIC CONSULTATION YES	PEDIATRIC CONSULTATION NO	SPECIAL SERVICES PROVIDED BY POST	SPECIAL SERVICES PROVIDED BY MEDICAL FACILITY	NEEDS IDENTIFIED BY CHIEF OF PEDIATRICS
Ft Belvoir, VA	0730-1630	X		X		X		Up to 48 hrs.		X	PNP		X	X				
Ft Benning, GA	0800-1630		X		X	X		1 hr.	X		Physician telephonically		X	X		Tot Town Nursery	Monthly Pediatric Cardiology Consult Visit	Seven day a week (0800-2300) telephonic triage by pediatrician.
Ft Bragg, NC	0800-1600		X	X		X			X		NP	X 1700-2200				Child Care	Hearing and vision test at schools.	More screening capability.
Ft Campbell, KY	0730-1630 M-F		X		X	X		Varies		X	Phone Triage by Nurse or Physician -R.N. Walk-in Screening		X	X		Child Care	Monthly Neuro, Cardiology and Hematology Consult visit from Vanderbilt Univ. Hospital.	Improved shuttle bus service (transportation)
Ft Carson, CO	0730-1615		X		X	X		Depends on results of telephone triage		X	Phone Triage by PNP or MD (0730-1000)		X	X		Nursery City Bus Service to Hospital	Patient Education Handouts. Monthly Cardiology, Pulmonology, Hematology, Endrocrinology, Neurology, Developmental, and Special well Baby Consult from Fitzsimons AMC. Afternoon Screening Clinic.	Patient education using videotape. Computerized records. Telephone sequencing system for incoming calls.
Ft Devens, MA	0800-1600	X 0800-1200		X		X		1/2 hour		X	None		X	X		Child Care Emergency Baby-sitting Infant Car Seats provided by ACS	Little Rascals Clinic 3-6 yrs. Well Baby Clinic. Chronic Care Appointments in afternoon.	Another pediatrician.
Ft Dix, NJ	0800-1630	X 0800-1200		X		X		No wait		X	None		X	X			Well Baby, Immunizations, WIC Program by Nurse Practitioners.	Child Neurology and Psychiatry.
Ft Hood, TX	0730-2100 Weekends/Holidays, 1330-2100	X 0800-1530		X 1600-2100 (M-F) 1330-2100 (S&S)		X		Varies	X		None		X	X		Child Care Bus from Ft Hood to BAMC (M-Th)	Subspecialties from BAMC visit each Tuesday.	More pediatricians.
Ft Jackson, SC	0730-1615		X		X	X		Not more than 2 hrs.		X	None		X	X		Child Care CWS	Monthly Cardiology. Speech evaluation every 2 weeks. Pediatric Psychiatry. School/sports physical exams.	

APPENDIX D - COMPARISON OF PEDIATRIC OUTPATIENT SERVICES PROVIDED BY 30 MILITARY MEDICAL FACILITIES (Cont'd)

HOSPITAL FACILITY	PEDIATRIC CLINIC HOURS	PEDIATRIC SICK-CALL YES	PEDIATRIC SICK-CALL NO	PEDIATRIC WALK-IN YES	PEDIATRIC WALK-IN NO	PEDIATRIC SHOT SERVICE YES	PEDIATRIC SHOT SERVICE NO	APPOINTMENT WAIT TIME	UTILIZATION OF TECH's YES	UTILIZATION OF TECH's NO	PHYSICIAN SUPERVISES	PEDIATRIC ER YES	PEDIATRIC ER NO	PEDIATRIC CONSULTANTS YES	PEDIATRIC CONSULTANTS NO	SPECIAL SERVICES PROVIDED BY POST	SPECIAL SERVICES PROVIDED BY MEDICAL FACILITY	NEEDS IDENTIFIED BY CHIEF OF PEDIATRICS
Ft Knox, KY	0730-1630		X		X	X		Less than 1 hour		X	Nurse trained by physician		X	X		Nurseries	Pediatric OT, PT, Psychology, Psychiatry, Respiratory Therapy, Audiometric and Speech Therapy.	ENT Service.
Ft Lee, VA	0800-1700	X 0800-1115 1300-1545		X			X			X	None		X	X		Nursery Transportation for acutely sick patients	Well Baby Clinic. Pediatric Allergy Evaluation. School Physical Examinations. Child Abuse Evaluation.	Pediatric ENT.
Ft Leonard Wood, MO	0730-1630	X 0820-1100			X	X AM only		Morning slots only		X	None		X	X			Community Pre-School Screening. Mobile Medical Evaluation Team, four hours per week.	Day Care for siblings. Adolescent Clinic, Developmental Clinic, Early Intervention Therapy Group Classes.
Ft Ord, CA	0745-1630 (M-F) 0800-1600 (S-S)	X		X		X		30-90 minutes		X	RN		X	X				Video recorder for educational tapes. Improved access to medical care for unaccompanied adolescent minors.
Ft Polk, LA	0800-1640	X 0830-1600			X	X				X	RN		X	X			Orthopedics, Ophthalmology, Child Psychologist.	Neurology, Allergy, Nephrology.
Ft Riley, KS	0730-1630	X 0930-1100 1300-1530 Mon 1300-1530 T-F			X	X				X	None		X	X			Adolescent Clinic, Wart Clinic, Asthma Clinic, Hematology Clinic, Periodic Specialty Visits.	
Ft Sill, OK	0730-1630	X			X	X		Varies Approx. 43 openings per day		X	None		X	X		Child Care Post Shuttle Bus Bus from YMCA 4 times daily	Monthly Consultant Visits for Cardiology, Gastroenterology, Pulmonary, Developmental, Hematology, Infectious Disease, Neurology, Nephrology. Weekly Well Baby Clinic. Community Health Nurse. Social Work Services.	Child Psychology.
Ft Stewart, GA	0730-1630	X 0830-1130			X	X				X	Phone Triage by RN		X	X			Child Care (Limited)	Neurology, Adolescent Cardiology, Asthma/Allergy, GI, Urinary tract, Developmental, Hyperactivity, Immunization Clinics. Teaching OTDs & Nurses.	More appointment slots. Increased respiratory therapy care. Separate adolescent clinic.
West Point, NY	0800-1630	X 0800-1630		X Space avail.		X		2 to 3 hours		X	None		X	X			Day Care 0730-1730 Shuttle Bus every 15 minutes	Allergy testing, Dermatology, Immunizations, ENT Specialist, Learning or Neurological Evaluations, Adolescent Problems.	Child Psychologist.

APPENDIX D - COMPARISON OF PEDIATRIC OUTPATIENT SERVICES PROVIDED BY 30 MILITARY MEDICAL FACILITIES (Cont'd)

HOSPITAL LOCATION	PEDIATRIC CLINIC HOURS	PEDIATRIC SICK-CALL YES	PEDIATRIC SICK-CALL NO	PEDIATRIC WALK-IN YES	PEDIATRIC WALK-IN NO	PEDIATRIC SOA YES	PEDIATRIC SOA NO	APPROXIMATE WAIT TIME	UTILIZATION OF PDC's YES	UTILIZATION OF PDC's NO	PATIENT SURVEYS	PEDIATRIC ER YES	PEDIATRIC ER NO	PEDIATRIC CONSULTATION YES	PEDIATRIC CONSULTATION NO	SPECIAL SERVICES PROVIDED BY POST	SPECIAL SERVICES PROVIDED BY MEDICAL FACILITY	NEEDS IDENTIFIED BY CHIEF OF PEDIATRICS
Frankfurt, GY 97th Gen.	0730-1630	X 0830-1130			X	X		1 hour	X Outlying Areas		None		X	X		Child Care	Same-day referral system for 12 outlying clinics. Nursery on Hospital Grounds.	More physicians and nurse practitioners seeing patients.
BAMC Fort Sam Houston, TX	0730-1800 M-F 1000-1800 S-S		X		X	X				X	None	X 1600-1800 M-F 1000-1800 S-S (After hrs Clinic)		X			After hours clinic.	Child Care for siblings.
EAMC Ft Gordon, GA	0730-1600		X	X Emergencies Only		X		15 minutes to several hours		X	None		X	X				Child Care for siblings.
FAMC Aurora, CO	0800-1630		X	X			X		NA		None		X	X			Pediatrician in ER 0800-2000 M-F and 0800-2100 Saturdays. Adolescent services, Developmental Services, All routine sub-specialties.	Improving Adolescent support.
LAMC San Francisco, CA	0800-1600		X	X			X			X	None		X	X			Computerized Central Appointment System, Cardiology, Neurology, Special Well Baby, Hemocology-Oncology, Endocrinology, Developmental Clinic, Pulmonary Clinic, Adolescent Medicine, Dermatology, Gastroenterology.	
MAMC Ft Lewis, WA	0900-2030	X 0900-2130			X	X		1 day		X	None		X	X			Pediatric pharmacy in clinic.	Outpatient records kept in clinic.
TAMC Honolulu, HI	0800-1630	X 0800-1630				X				X	None	X 24-hour service				Child Care Transportation Assistance	Well Baby Care. Sick Child Clinic.	
WRAMC Washington, DC	0745-1630	X 0900-1145 1300-1400		X Discouraged		X		1 to 2 hours	NA		Telephonic by Nurse or 91C		X	X		Child Care Transportation	Pediatric Clinic functions as emergency service 0745-1630.	
WBAMC Ft Bliss, TX	0830-1600 M-F 1800-2000 S-S	X 0830-1600 M-F 1800-2000 S-S			X	X		20 minutes to couple of hours		X	BSN and LVN		X	X		Child Care Shuttle Bus Car Seats for Infants (ACS) Child Abuse Counselling	Have all pediatric sub-specialties except Psychology.	More easily accessible child care for siblings.

APPENDIX D (Cont'd)

[illegible]	PEDIATRIC CLINIC HOURS	PEDIATRIC SICK-CALL YES	NO	PEDIATRIC WALK-IN YES	NO	PEDIATRIC SDA YES	NO	[illegible]	UTILIZATION OF TMC's YES	NO	[illegible]	[illegible] YES	NO	[illegible] YES	NO	SOCIAL SERVICES PROVIDED BY POST	SPECIAL SERVICES PROVIDED BY MEDICAL FACILITY	NEEDS IDENTIFIED BY CHIEF OF PEDIATRICS
NNMC Bethesda, MD	0800-2100	X 0800-2100		X		X		4 hours		X	None		X	X		Child Care Social Work Services Child Advocacy	Have all subspecialties, teaching hospital.	
NNRC Great Lakes, IL	0730-1630	X 0900-1600			X	X		1-3 hours		X	RN		X	X			Orthopedics, ENT, Audiology, PT, Ophthalmology, Cardiology, Neurology, Hematology, Urology, Gastroenterology, Infectious Disease, Family Services.	Allergy.
NRMC Camp Pendleton, CA	0800-1630	X			X		X			X	LVN & RN Telephonic & Walk-In		X	X		Child Care	Adolescent medicine clinic, Development Disabled Children Resource Coordinator, Pediatric Nurse and Well Baby in Housing Area.	Speech therapy, Pediatric Psychology, more frequent transportation.
US Air Force Academy	0830-1630		X	X		X		30 minutes		-	RN		X	X			Well Baby Clinic, Adolescent Clinic, Neurology, Hematology, Cardiology Clinics.	

APPENDIX E

THE CHI-SQUARE TEST OF INDEPENDENCE

FOR WAITING TIME AND ESCORT'S PERCEPTION

APPENDIX E - THE CHI-SQUARE TEST OF INDEPENDENCE FOR WAITING TIME AND ESCORT'S PERCEPTION

	Hours Wait	Escort's Perception: Reasonable	Expected Cell Freq. (ECF)	Faily long	ECF	Very long	ECF	Total
ER Wait In Hours	0-.49	32	(11.6395)	1	(7.8023)	0	(13.5581)	33
	.5-.99	27	(13.0504)	8	(8.7481)	2	(15.2016)	37
	1-1.49	15	(9.1705)	9	(6.1473)	2	(10.6822)	26
	1.5-1.99	7	(8.1124)	8	(5.4380)	8	(9.4496)	23
	2-2.45	7	(13.4031)	18	(8.9845)	13	(15.6124)	38
	2.5-2.99	1	(8.4651)	8	(5.6744)	15	(9.8605)	24
	3-3.45	1	(8.8178)	6	(5.9109)	18	(10.2714)	25
	3.5-3.99	0	(4.9380)	1	(3.3101)	13	(5.7519)	14
	4-4.49	1	(7.4070)	0	(4.9651)	20	(8.6279)	21
	±4.5	0	(5.9961)	2	(4.0194)	15	(6.9845)	17
	Total	91		61		106		258

H_0 = Waiting time and escort's attitude are independent

H_1 = The two variables are not independent

$$\text{Computed } X^2 = \frac{(32 - 11.6395)^2}{11.6395} + \frac{(27 - 13.0504)^2}{13.0504} + \frac{(15 - 9.1705)^2}{9.1705} + \frac{(7 - 8.1124)^2}{8.1124} + \frac{(\quad - 13.4031)^2}{13.4031} +$$

$$\frac{(1 - 8.4651)^2}{8.4651} + \frac{(1 - 8.8178)^2}{8.8178} + \frac{(0 - 4.9380)^2}{4.9380} + \frac{(1 - 7.4070)^2}{7.4070} + \frac{(0 - 5.9961)^2}{5.9961} +$$

$$\frac{(1 - 7.8023)^2}{7.8023} + \frac{(8 - 8.7481)^2}{8.7481} + \frac{(9 - 6.1473)^2}{6.1473} + \frac{(8 - 5.4380)^2}{5.4380} + \frac{(18 - 8.9845)^2}{8.9845} +$$

$$\frac{(8 - 5.6744)^2}{5.6744} + \frac{(6 - 5.9109)^2}{5.9109} + \frac{(1 - 3.3101)^2}{3.3101} + \frac{(0 - 4.9651)^2}{4.9651} + \frac{(2 - 4.0194)^2}{4.0194} +$$

$$\frac{(0 - 13.5581)^2}{13.5581} + \frac{(2 - 15.2016)^2}{15.2016} + \frac{(2 - 10.6822)^2}{10.6822} + \frac{(8 - 9.4496)^2}{9.4496} + \frac{(13 - 15.6124)^2}{15.6124} +$$

$$\frac{(15 - 9.8605)^2}{9.8605} + \frac{(18 - 10.2714)^2}{10.2714} + \frac{(13 - 5.7519)^2}{5.7519} + \frac{(20 - 8.6279)^2}{8.6279} + \frac{(15 - 6.9845)^2}{6.9845} +$$

$X^2 = 35.62 + 14.91 + 3.71 + 0.15 + 3.06 + 6.58 + 6.93 + 4.94 + 5.54 + 6.00 + 5.93 + 0.06 + 1.32 + 1.21 + 9.05 + 0.95 +$
$0.00 + 1.61 + 4.97 + 1.01 + 13.56 + 11.46 + 7.06 + 0.22 + 0.44 + 2.68 + 5.82 + 9.13 + 14.99 + 9.20$

$X^2 = 188.11$

$df = 13$

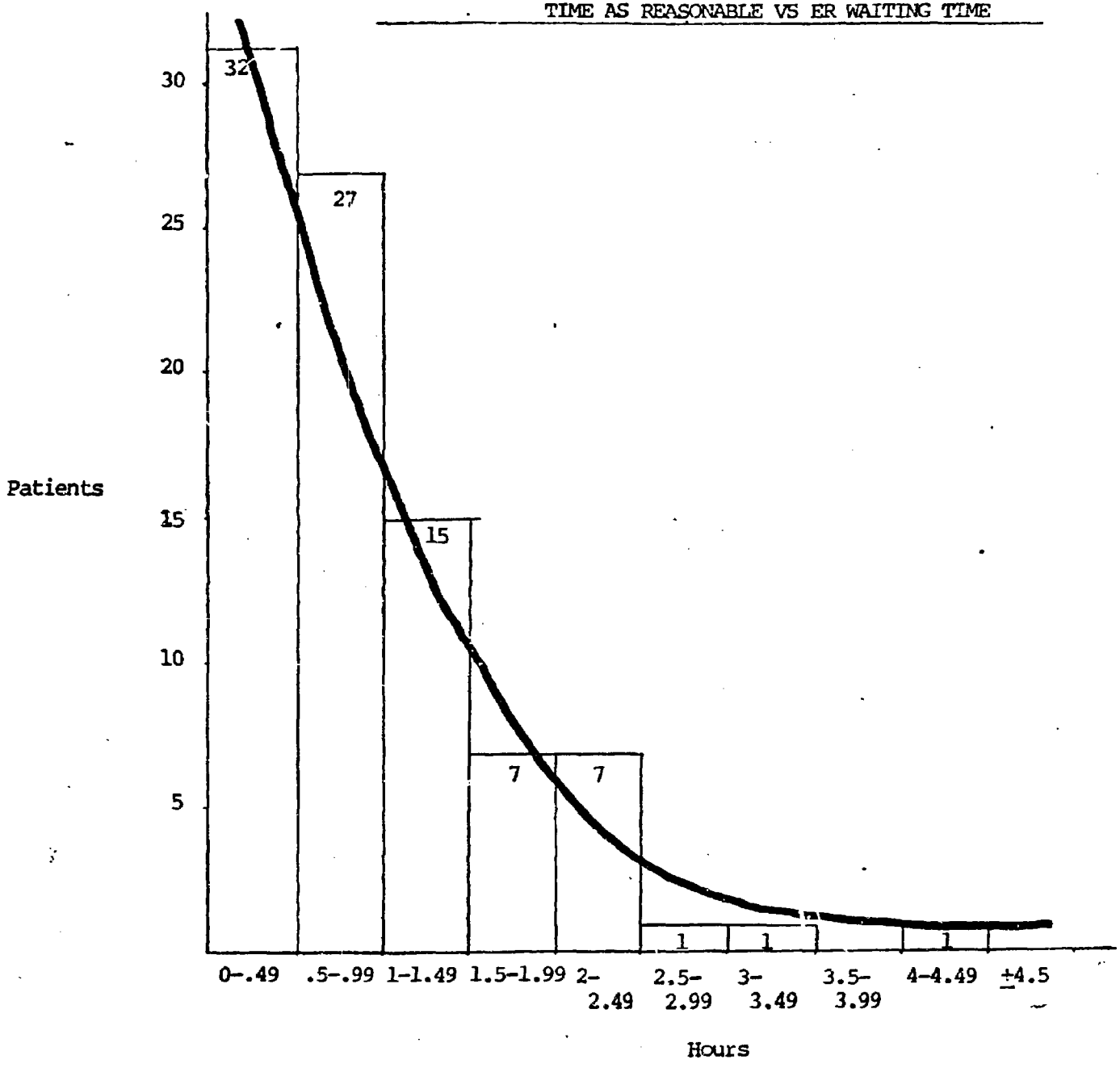
$X^2_{13,0.995} = 29.819$

Since 188.11 is greater than $X^2_{13,0.995} = 29.819$, we reject the H_0 at the 0.005 level of significance. We conclude that waiting time and escort's attitude are not independent. With a P value $< .005$.

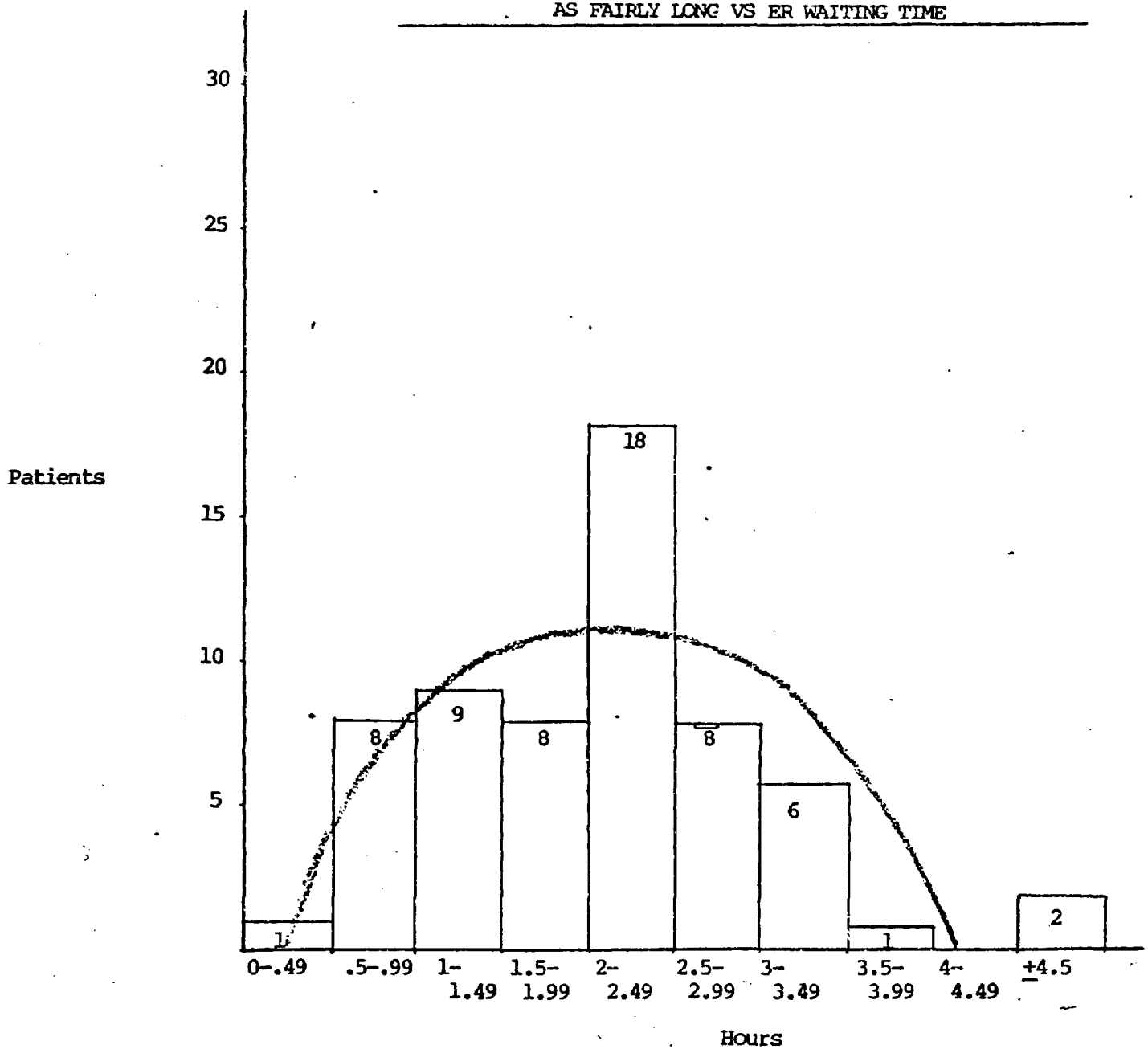
APPENDIX F

HISTOGRAMS OF ESCORTS' PERCEPTIONS VS ER WAITING TIMES

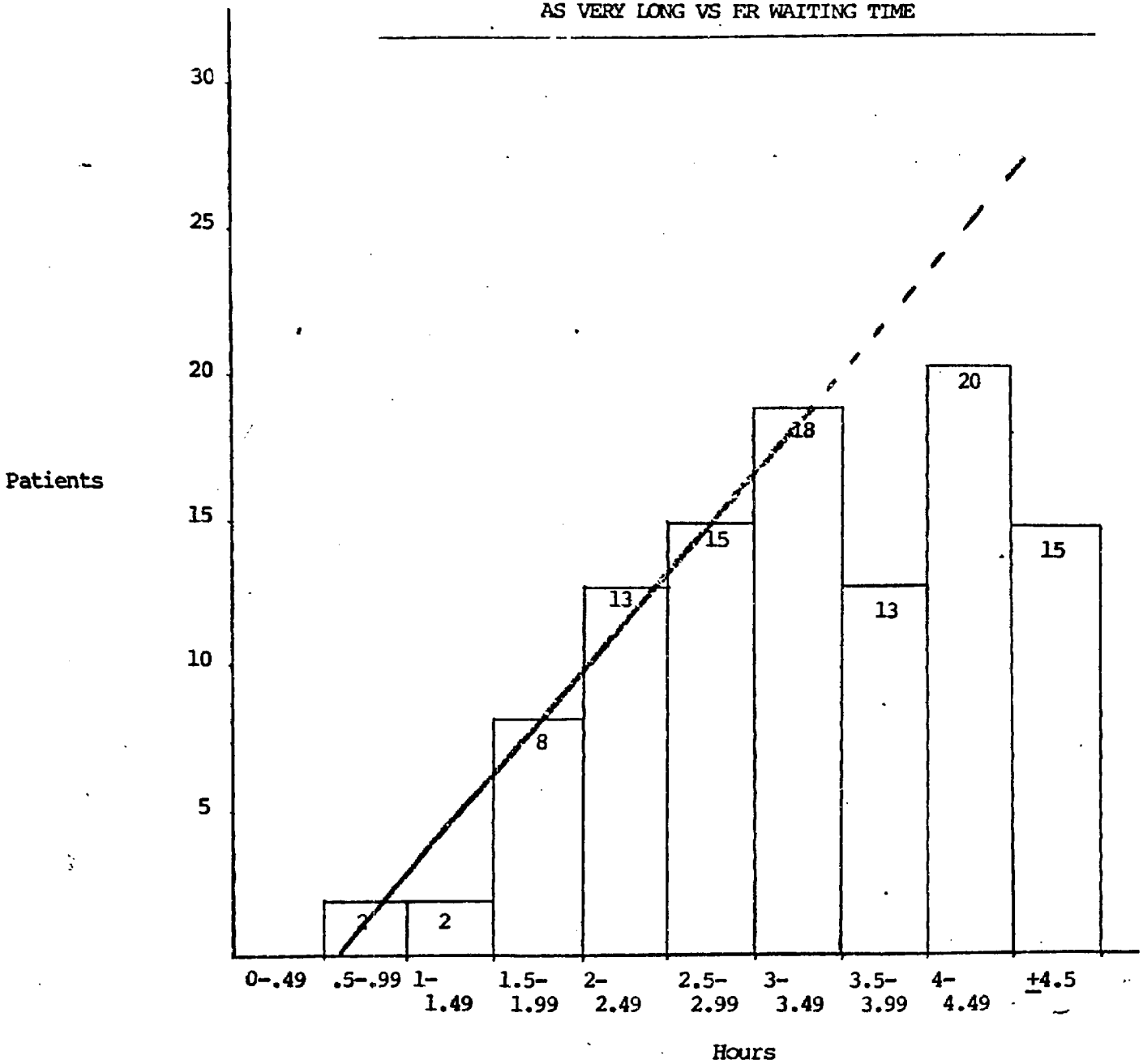
APPENDIX F - NUMBER OF ESCORTS PERCEIVING ER WAITING TIME AS REASONABLE VS ER WAITING TIME



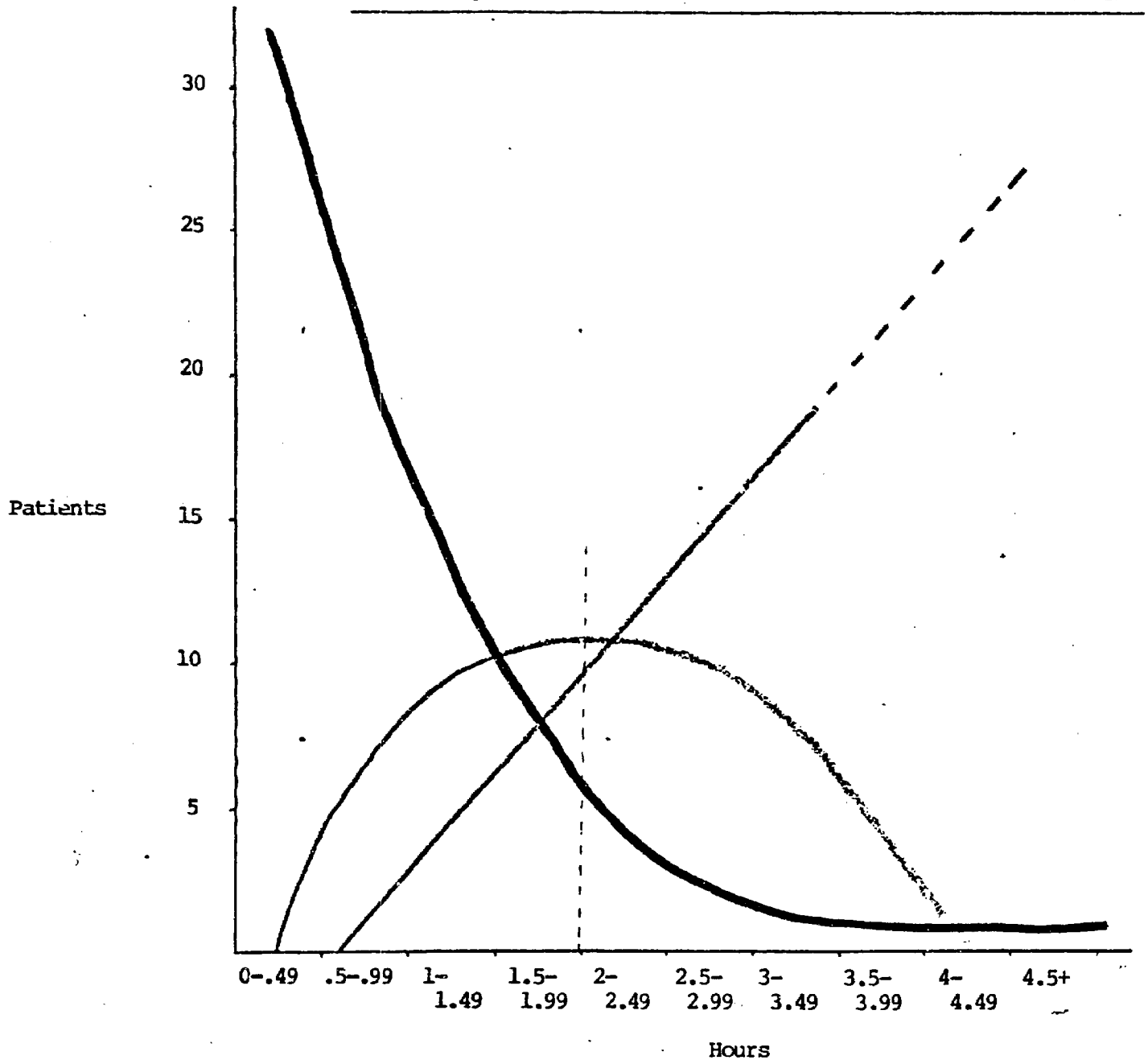
APPENDIX F - NUMBER OF ESCORTS PERCEIVING ER WAITING TIME AS FAIRLY LONG VS ER WAITING TIME



APPENDIX F- NUMBER OF ESCORTS PERCEIVING ER WAITING TIME AS VERY LONG VS FR WAITING TIME



APPENDIX F- COMPARISON OF ESCORTS' PERCEPTIONS VS ER WAITING TIME



APPENDIX G

ER UTILIZATION BY CHILDREN

12 YEARS AND LESS

APPENDIX G - ER UTILIZATION BY CHILDREN 12 YEARS AND LESS

Feb	Total	0001-0730	0731-1630	1631-2400
1,Tues	35/117	3/11	10/40	22/66
2,Wed	49/131	4/12	19/54	26/65
3,Thur	48/133	8/13	15/57	25/63
4,Fri	44/117	6/12	24/72	14/33
5,Sat	72/206	8/21	36/115	28/70
6,Sun	79/188	10/21	41/99	28/68
7,Mon	61/149	3/11	24/58	34/80
8,Tues	47/129	5/10	17/50	25/69
9,Wed	47/128	3/10	19/48	25/70
10,Thur	71/147	4/8	27/62	40/77
11,Fri	53/129	10/15	15/52	28/62
12,Sat	66/202	7/20	36/112	23/70
13,Sun	55/154	5/12	30/82	20/50
14,Mon	64/156	10/18	19/58	35/80
15,Tues	54/150	3/6	23/71	28/73
16,Wed	58/157	7/17	14/53	37/87
17,Thur	58/167	6/21	19/76	33/80
18,Fri	57/157	5/19	15/60	37/78
19,Sat	73/228	7/41	39/118	27/69
20,Sun	71/198	5/25	39/84	27/89
21,Mon	78/203	6/1[illegible]	48/121	24/64
22,Tues	61/140	2/9	17/35	42/96
23,Wed	44/127	4/8	13/48	27/71
24,Thur	25/104	4/11	9/45	12/48
25,Fri	25/111	3/15	5/44	17/52

APPENDIX G (Cont'd)

Feb	Total	0001-0730	0731-1630	1631-2400
26,Sat	52/164	3/17	28/96	21/51
27,Sun	56/168	6/16	23/89	27/63
28,Mon	38/121	3/11	16/31	19/79
Totals	1541/4281	150/428	640/1930	751/1923
Percent	.36	.35	.33	.39

% of Total Workload

1541/4281 = .3599626

.36

36% of the ER's workload is for children aged 12 and below

49% of ER visits by children 12 years and less are between the hours of 1631-2400 and 58% between 1631-0730

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